

1	0	US 5922345 A	USPAT	19990713	8	
		Nutrition	424/439	514/558; 514/560		Horrobin,
David F. et al.	0	0	0	0	0	US Full Image US
5922345	0					
1	0	WO 200120001 A	DERWENT	20010322	62	New
		nucleic acid encoding delta6-desaturase from Tetrahymena, useful for producing ciliates and plants with increased levels of unsaturated fatty acids				
		BLONDEAU, J P et al.	0	0	0	0
		Foreign Full: First Abstracted	WO 200120001 A1	0		
1	0	DE 10044468 A	DERWENT	20030311	30	New
		nucleic acid encoding delta-6-desaturase, useful for producing ciliates and plants that overproduce unsaturated fatty acids, derived from Tetrahymena				
		DOMINITZKI, A et al.	0	0	0	0
		Foreign Full: First Abstracted	DE 10044468 A1	0		
0	0	WO 200102591 A	DERWENT	20010111	49	
		Production of unsaturated fatty acids, useful e.g. in nutrition, cosmetics or pharmaceuticals, in organisms transformed with Physcomitrella patens delta-6-desaturase nucleic acid				
			DA COSTA E SILVA, O et al.		1	
	0	0	0	0	0	Foreign Full: First Abstracted
200102591 A10						WO
1	0	WO 200075341 A	DERWENT	20030114	70	
		Nucleic acid encoding delta6-acetylenase or desaturase, useful for producing plant oils with increased content of unsaturated fatty acids				
		GIRKE, T et al.	0	0	0	0
		Foreign Full: First Abstracted	WO 200075341 A1	0		

L5 ANSWER 1 OF 15 MEDLINE on STN  
ACCESSION NUMBER: 88216318 MEDLINE  
DOCUMENT NUMBER: 88216318 PubMed ID: 3367809  
TITLE: The role of unnatural dietary trans and cis unsaturated fatty acids in the epidemiology of coronary artery disease.  
AUTHOR: Booyens J; Louwrens C C; Katzeff I E  
CORPORATE SOURCE: Department of Physiology, Medical University of Southern Africa, Medunsa.  
SOURCE: MEDICAL HYPOTHESES, (1988 Mar) 25 (3) 175-82.  
Journal code: 7505668. ISSN: 0306-9877.  
PUB. COUNTRY: ENGLAND: United Kingdom  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 198806  
ENTRY DATE: Entered STN: 19900308  
Last Updated on STN: 19970203  
Entered Medline: 19880621

AB During 1956 the first report on the hypocholesterolemic effect of unsaturated fatty acids of plant and marine origin was published in The Lancet. Consequently it was stated in a Lancet Editorial that hydrogenation of vegetable oils could have contributed to the causation of coronary artery disease and predicted that a decade would probably be required to resolve this question. However, after the lapse of three decades this issue would appear to be no nearer to a clear answer now than it was then. During 1956 hydrogenation was assumed to effect only a reduction in the level of unsaturated fatty acids in the products produced from hydrogenated oils. However, since that time essential fatty acid metabolic pathways to eicosanoids were discovered and described. Also large quantities of unnatural trans and cis unsaturated fatty acids have been shown to form during hydrogenation and these occur in margarines and many other common foods in high concentrations. It has also been shown that these unnatural trans and cis fatty acids block essential fatty acid metabolism by the competitive inhibition of the **desaturase** enzyme **delta-6-desaturase**. Therefore some of the possible metabolic mechanisms whereby "hydrogenation plants could have contributed to the causation of a major disease" have become clearer during the last three decades. Despite a recent conclusion by an ad hoc FDA panel that there need be little concern about the effects of trans fatty acids in the American diet on health, it is nevertheless proposed that on the basis of available evidence, unnatural dietary trans and cis **unsaturated fatty acid** isomers should be regarded as a definite risk factor in the etiology of coronary artery disease.

L5 ANSWER 2 OF 15 MEDLINE on STN  
ACCESSION NUMBER: 84290809 MEDLINE  
DOCUMENT NUMBER: 84290809 PubMed ID: 6470514  
TITLE: Variation in sebum fatty acid composition among adult humans.  
AUTHOR: Green S C; Stewart M E; Downing D T  
CONTRACT NUMBER: AM-22083 (NIADDK)  
SOURCE: JOURNAL OF INVESTIGATIVE DERMATOLOGY, (1984 Aug) 83 (2) 114-7.  
Journal code: 0426720. ISSN: 0022-202X.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 198409  
ENTRY DATE: Entered STN: 19900320  
Last Updated on STN: 19970203  
Entered Medline: 19840924

AB Quartz capillary gas chromatography was used to analyze the wax ester fatty acids of 4 sebum samples collected at 2-week intervals from each of 10 adult human subjects. Marked differences in wax ester fatty acid composition between subjects were apparent. The greatest variation was present in the even-carbon-numbered iso-branched acids, which ranged from 1-22% of the monounsaturated acids and from 1-13% of the saturated acids. The anteiso chain structures formed 3-7.5% of the unsaturated acids and 3-13.5% of the saturated acids. Fatty acids bearing one or more methyl branches at other positions in the chain made up 12-22% of the saturated acids, but were not present in the **unsaturated fatty acid** fraction. This and other features of the composition of the unsaturated fatty acids indicate that the delta 6-**desaturase** that produces the monounsaturated fatty acids of human sebum requires a substrate having a straight chain of at least 12 carbon atoms extending from the carboxyl group. The differences in fatty acid composition between subjects and the constancy of composition for each of the subjects over the 2-month period indicate that the synthesis of each of the types of chain structure is under genetic control.

L5 ANSWER 3 OF 15 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
ACCESSION NUMBER: 1996:526350 BIOSIS  
DOCUMENT NUMBER: PREV199699248706  
TITLE: In vitro metabolism of 14C-polyunsaturated fatty acids in midgut gland and ovary cells from *Penaeus kerathurus* Forskal at the beginning of sexual maturation.  
AUTHOR(S): Mourente, Gabriel  
CORPORATE SOURCE: Dep. Biol. Anim., Veg. Ecol., Fac. Ciencias Mar, Univ. Cadiz, Poligono del Rio San Pedro, Apartado-40, D-11510 Puerto Real, Spain  
SOURCE: Comparative Biochemistry and Physiology B, (1996) Vol. 115, No. 2, pp. 255-266.  
CODEN: CBPBB8. ISSN: 0305-0491.  
DOCUMENT TYPE: Article  
LANGUAGE: English  
ENTRY DATE: Entered STN: 22 Nov 1996.  
Last Updated on STN: 23 Nov 1996

AB The incorporation and metabolism via the **desaturase**/elongase pathway of (1-14C)18:2(n-6) linoleic acid (LA), (1-14C)18:3(n-3) linolenic acid (LNA), (1-14C)20:4(n-6) arachidonic acid (AA) and (1-14C)20:5(n-3) eicosapentaenoic acid (EPA) were studied in midgut gland and ovary cell suspensions from wild-caught adult females of *Penaeus kerathurus* Forskal at the beginning of sexual maturation. The incorporation and recovery of radioactivity in total lipids of midgut gland cells was greater for (1-14C)LA and (1-14C)LNA than for (1-14C)AA or (1-14C)EPA, indicating a preferential retention of C-18-polyunsaturated fatty acids (PUFAs) in this organ. The recovery of radioactivity from all PUFA decreased during the time course. The incorporation of (1-14C)PUFAs into total polar lipids in midgut gland cells increased during the time course (from 33.4% to 65.2%) with a concomitant decrease into total neutral lipids. These changes were due to significantly increased incorporation into phosphatidylcholine (PC), phosphatidylethanolamine (PE) and phosphatidylinositol (PI), with significantly decreased incorporation into triacylglycerol (TAG). (1-14C)AA and (1-14C)EPA were preferentially incorporated into PI, and (1-14C)EPA was more important in phospholipid synthesis in midgut gland cells than (1-14C)-labeled LA, LNA or AA. The incorporation and recovery of radioactivity in total lipids from ovary cells was significantly lower than in midgut gland cells but significantly increased during the time course with all the (1-14C)PUFAs. The distribution of radioactivity from (1-14C)AA and (1-14C)EPA in ovary cells showed preferential retention into polar lipid classes compared with (1-14C)LA or (1-14C)LNA, and the general pattern was of net synthesis of PC at the expense of PE, free fatty acid and TAG. The results indicated that midgut gland and ovary cells have only a limited ability to convert C-18-PUFA to C-20- and C-22-highly

**unsaturated fatty acid.** The recovery of radioactivity in 22:6(n-3) was approx 10-fold greater with (1-14C)EPA than with (1-14C)LNA as precursor. Substantial amounts of radioactivity were recovered in 24:5(n-6), 24: 5(n-3) and 24:6(n-3), particularly in cells incubated with (1-14C)EPA, indicating that the conversion of EPA to DHA in both organs may occur by a pathway using DELTA-6-desaturase activity rather than by a DELTA-4-desaturation.

L5 ANSWER 4 OF 15 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
ACCESSION NUMBER: 1989:492182 BIOSIS  
DOCUMENT NUMBER: PREV198988118719; BA88:118719  
TITLE: FATTY ACIDS AND DISEASE PART 1. THE UNSATURATED FATTY ACIDS WHICH MIGHT RESTRICT ESSENTIAL FATTY ACID METABOLISM IN EDIBLE LIPIDS PRODUCED IN SOUTH AFRICA.  
AUTHOR(S): NOURSE L D [Reprint author]; GRIERSON G R; SMIT L E  
CORPORATE SOURCE: ANIMAL DAIRY SCI RES INST, PRIVATE BAG X2, IRENE 1675  
SOURCE: South African Journal of Dairy Science, (1989) Vol. 21, No. 1, pp. 9-15.  
CODEN: SATSED. ISSN: 0258-3321.  
DOCUMENT TYPE: Article  
FILE SEGMENT: BA  
LANGUAGE: ENGLISH  
ENTRY DATE: Entered STN: 2 Nov 1989  
Last Updated on STN: 4 Nov 1989

AB Edible lipids produced in South Africa, such as butters, crude and refined vegetable oils and their hydrogenated products, were analysed for their **unsaturated fatty acid** content and in particular those isomers, which includes the trans isomers, that might interfere with essential fatty acid metabolism by blocking **desaturase** reactions. In butters six with a single double bond were separated by capillary gas chromatography; the predominant being oleic acid (about 18% of the total lipid) which will compete with essential fatty acid binding to delta-6-desaturase. These **unsaturated fatty acid** isomers total nearly 10-fold the concentration of essential fatty acids in butters. Only trace levels of 18:2 isomers were found. In hydrogenated oils 9 different isomers of 18:1 were separated totalling from 30-59% of lipid, the total level depending on the oil used and the degree of hydrogenation. In margarines these would be diluted depending on the amount of oil added. The level of 18:2 isomers varied in relation to the degree of hydrogenation; highly hydrogenated oils having low levels (about 0, 15% of the total lipid) and those less hydrogenated having as much as 4%. At present most margarines and other hydrogenated oil products are made from highly hydrogenated oils to which is added refined vegetable oils to the level of required polyunsaturation, so these products contain only low levels of these 18:2 isomers. Crude vegetable oils contained only oleic acid which might interfere with EFA metabolism while some refined oils contained between 1- 3,5% of the 18:2 isomers. In known samples this occurred when alkali was used in refining to remove free fatty acids. The effect these isomers might have on essential fatty acid metabolism under South African eating patterns is discussed.

L5 ANSWER 5 OF 15 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN  
ACCESSION NUMBER: 1984:349495 BIOSIS  
DOCUMENT NUMBER: PREV198478085975; BA78:85975  
TITLE: INFLUENCE OF REDUCED FOOD INTAKE ON POLY **UNSATURATED FATTY-ACID** METABOLISM IN ZINC DEFICIENT RATS.  
AUTHOR(S): KRAMER T R [Reprint author]; BRISKE-ANDERSON M; JOHNSON S B; HOLMAN R T  
CORPORATE SOURCE: US DEP OF AGRIC, AGRIC RES SERVICE, GRAND FORKS HUMAN NUTRITION RES CENT, GRAND FORKS, ND 58202, USA  
SOURCE: Journal of Nutrition, (1984) Vol. 114, No. 7, pp.

1224-1230.

CODEN: JONUAI. ISSN: 0022-3166.

DOCUMENT TYPE: Article

FILE SEGMENT: BA

LANGUAGE: ENGLISH

AB The influence of reduced food intake on metabolism of liver phospholipids (PL) in Zn-deficient (ZD) rats was measured. Weanling male Long-Evans rats were fed ad lib Zn-deficient (2 .mu.g Zn/g diet) and Zn-adequate (20 .mu.g Zn/g diet) diets for 21 days. A pair-fed (PF) group was included. ZD and PF rats displayed significantly increased levels of linoleic (18:2.omega.6) and dihomo-.gamma.-linolenic acid (20:3.omega.6). Both ZD and PF rats displayed increased levels of .gamma.-linolenic acid (18:3.omega.6), but the increase was significant only in PF rats. ZD and PF rats displayed decreased levels of arachidonic acid (20:4.omega.6), but the decrease was significant only in PF rats. Both ZD and PF rats displayed significantly reduced levels of 22:5.omega.6. Both ZD and PF rats displayed increased products of .DELTA.6 desaturation and decreased products of .DELTA.5 and .DELTA.4 desaturation. Significantly increased products of .DELTA.9 desaturation were noted in both ZD and PF rats. ZD and PF rats displayed significant increases in C20 elongation products. ZD and PF rats displayed significantly decreased levels of .omega.6 metabolites but not total .omega.6 acids. ZD rats showed significantly increased levels of total .omega.3 acids and .omega.3 metabolites. ZD and PF rats showed significant increases in .omega.9 acids but not significant changes in .omega.9 metabolites. This study does not indicate that Zn affects the .DELTA.6 **desaturase** in the metabolism of essential fatty acids. The aberrations previously attributed to Zn deficiency are probably due to the accompanying decreased food intake.

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ACCESSION NUMBER: 1999251982 EMBASE

TITLE: Sjogren-Larsson syndrome: Early diagnosis, dietary management and biochemical studies in two cases.

AUTHOR: Taube B.; Billeaud C.; Labreze C.; Entressangles B.; Fontan D.; Taieb A.

CORPORATE SOURCE: Prof. A. Taieb, Unite de Dermatologie Pediatrique, Hopital Pellegrin-Enfants, F-33076 Bordeaux, France.  
alain.taieb@dermatol.u-bordeaux2.fr

SOURCE: Dermatology, (1999) 198/4 (340-345).  
Refs: 22

ISSN: 1018-8665 CODEN: DERAEG

COUNTRY: Switzerland

DOCUMENT TYPE: Journal; Article

FILE SEGMENT: 007 Pediatrics and Pediatric Surgery  
013 Dermatology and Venereology  
029 Clinical Biochemistry  
037 Drug Literature Index

LANGUAGE: English

SUMMARY LANGUAGE: English

AB Background: Sjogren-Larsson syndrome (SLS) is a rare autosomal recessive disorder with worldwide distribution. It consists of ichthyosis, spastic diplegia and mental retardation caused by an enzymatic defect in fatty alcohol oxidation. Objective: To study the effects of dietary management on clinical outcome and plasma/red blood cell fatty alcohol and plasmalogen concentrations, Methods: To reduce fatty alcohol production, we reduced total fat intake to 30% of total intake of calories. To correct .delta. 6 **desaturase** deficiency, we supplemented the diet with both n-3 and n-6 fatty acids to obtain a linoleic/linolenic acid ratio of 6 with low erucic acid rapeseed oil, plus high unsaturated fatty acids. We used gas liquid chromatography to assay blood cell membranes and plasma fatty alcohols/plasmalogens. Results: Two SLS infants with proven fatty alcohol/NAD+ oxidoreductase deficiency were studied. Good clinical

results were obtained in one of the patients when dietary intervention was started in early infancy and correlated well with plasma fatty alcohol decrease. However, no clinical improvement was seen in the other patient who started later with low compliance. Acitretin therapy was necessary to control skin symptoms in this second patient. Conclusion: Dietary intervention using the combined approach described here may improve fatty alcohol metabolism in SLS. However, only very early intervention seems clinically beneficial.

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ACCESSION NUMBER: 96140992 EMBASE  
DOCUMENT NUMBER: 1996140992  
TITLE: Expression of a cyanobacterial **.DELTA.6-desaturase** gene results in  $\gamma$ -linolenic acid production in transgenic plants.  
AUTHOR: Reddy A.S.; Thomas T.L.  
CORPORATE SOURCE: Department of Biology, Texas A and M University, College Station, TX 77843, United States  
SOURCE: Nature Biotechnology, (1996) 14/5 (639-642).  
ISSN: 0733-222X CODEN: NABIF  
COUNTRY: United States  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB  $\gamma$ -Linolenic acid (GLA), a nutritionally important fatty acid in human and animal diets, is not produced in oil seed crops. Many oil seed plants, however, produce significant quantities of linoleic acid, a fatty acid that could be converted to GLA by the enzyme **.DELTA.6-desaturase** if it were present. As a first step to producing GLA in oil seed crops, we have cloned a cyanobacterial **.DELTA.6-desaturase** gene. Expression of this gene in transgenic tobacco resulted in GLA accumulation. Octadecatetraenoic acid, a highly unsaturated, industrially important fatty acid, was also found in transgenic tobacco plants expressing the cyanobacterial **.DELTA.6-desaturase**. This is the first example of engineering the production of 'novel' polyunsaturated fatty acids in transgenic plants.

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ACCESSION NUMBER: 96009506 EMBASE  
DOCUMENT NUMBER: 1996009506  
TITLE: Temperature-dependent changes in plasma-membrane lipid order and the phagocytotic activity of the amoeba *Acanthamoeba castellanii* are closely correlated.  
AUTHOR: Avery S.V.; Ll  yd D.; Harwood J.L.  
CORPORATE SOURCE: School Biological Molecular Sciences, Oxford Brookes University, Headington, Oxford OX3 0BP, United Kingdom  
SOURCE: Biochemical Journal, (1995) 312/3 (811-816).  
ISSN: 0264-6021 CODEN: BIJOAK  
COUNTRY: United Kingdom  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 004 Microbiology  
029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB The relationship between temperature-dependent changes in phagocytotic activity of *Acanthamoeba castellanii* and the fatty acid composition and physical properties of plasma membrane-enriched fractions were determined in cultures acclimated to 30.degree.C and 15.degree.C. Chilling (from 30.degree.C to 15.degree.C) had a very pronounced short-term inhibitory effect on phagocytosis only in stationary-phase cultures, which displayed

a low degree of fatty acid unsaturation. A subsequent increase in phagocytosis by these cells was correlated with a low-temperature-induced increase in fatty acid unsaturation, shown previously to be due to n-6 **desaturase** induction. Plasma membrane-enriched fractions from 15.degree.C-acclimated cells also showed a marked increase in the relative proportion of polyunsaturated fatty acids. Steady-state fluorescence depolarization studies, using the membrane probe diphenylhexatriene, revealed increases in plasma membrane order with decreasing assay temperature. Over the upper assay-temperature range (25-40.degree.C), fluorescence anisotropy values were higher in membranes from 30.degree.C-acclimated cells; a 3.3.degree.C relative displacement of plots indicated that temperature-induced changes in membrane lipid composition compensated for approx. 22% of the ordering effect of low temperature. Changes in the temperature-dependence of fluorescence anisotropy, possibly corresponding to lateral phase separations or alterations in other bulk physical properties of membranes, occurred between 20 and 25.degree.C in membranes from 30.degree.C-acclimated cells and between 15 and 20.degree.C in membranes from 15.degree.C-acclimated cells. Fluorescence anisotropy plots were superimposed at assay temperatures between 5 and 15.degree.C. Short-term phagocytotic rates in whole cells decreased with assay temperature. Arrhenius discontinuities in rates of phagocytosis occurred at approx. 25.0.degree.C and 17.5.degree.C in 30.degree.C- and 15.degree.C-acclimated cells respectively, and in each case were thus within the temperature ranges of slope-change in the corresponding fluorescence anisotropy plots. The results show a direct correlation between plasma membrane fatty acid unsaturation, membrane physical properties and phagocytotic activity in *A. castellanii*. Therefore, a specific integrated physiological process has been correlated with fatty acid **desaturase** induction for the first time.

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ACCESSION NUMBER: 95210526 EMBASE  
DOCUMENT NUMBER: 1995210526  
TITLE: Biosynthesis of unsaturated fatty acids in the main cell lineages of human leukemia and lymphoma.  
AUTHOR: Marzo I.; Martinez-Lorenzo M.J.; Anel A.; Desportes P.; Alava M.A.; Naval J.; Pineiro A.  
CORPORATE SOURCE: Dept. Bioquimica/Biologia Molecular, Facultad de Ciencias, Universidad de Zaragoza, 50009 Zaragoza, Spain  
SOURCE: Biochimica et Biophysica Acta - Lipids and Lipid Metabolism, (1995) 1257/2 (140-148).  
ISSN: 0005-2760 CODEN: BBLA6  
COUNTRY: Netherlands  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB Unsaturated fatty acids are essential for the proliferation of many haematopoietic cells, but little is known about their biosynthetic pathways in these cells. We have studied the activity of the main desaturation-elongation enzymes in human B-(Reh-6, Raji, Ramos) and T-(CEM, Jurkat) lymphocytic, promonocytic (U937), promyelocytic (HL-60) and pluripotent myeloid (K562) cell lineages, as well as the changes induced by cell differentiation. Cells were incubated with 14C-labelled 18:0, 18:2(n-6) and 18:3(n-3) or supplemented with the corresponding unlabelled fatty acid and synthesis of polyunsaturated fatty acids (PUFA) was evaluated by argentation-TLC and GLC. The main activity present in most cells was **.DELTA.9-desaturase** (range between 200-1000 pmol/24 h per 106 cells) that was regulated by the type of free fatty acids in culture media. A great variability in the activities of **.DELTA.6-and .DELTA.5-desaturase** was observed. They were virtually absent in B-cells and only one (Jurkat) T-cell line synthesized

significant amounts of (n-6) and (n-3) PUFA. The main PUFA formed by Jurkat cells were 20:3 and 20:4(n-6) (30 and 40%, respectively, of cell lipid radioactivity) and 20:5, 22:5 and 22:6(n-3) (60, 20 and 10%, respectively, of cell radioactivity) Cell differentiation caused complex changes in **desaturase** activities. The activity of .DELTA.9-**desaturase** increased with the degree of differentiation of B-cells Differentiation of U937 cells to macrophages with PMA caused a 2-3-fold increase in the activity of (.DELTA.6 + .DELTA.5)-and .DELTA.9-desaturases and no changes and a 2-fold decrease, respectively, if the inducer was DMSO. Differentiation of HL-60 cells to granulocytes with DMSO virtually abolished .DELTA.9-**desaturase** activity and greatly reduced that of .DELTA.6- and .DELTA.5-desaturases. .DELTA.9-**Desaturase** activity increased (2.5-fold) in myeloid K562 cells differentiated to erythroblasts with hemin. No induction of .DELTA.6-**desaturase**, absent in K562 cells, occurred after differentiation to erythroblasts or megakaryoblasts and they synthesized alternative PUFA through sequential elongation and .DELTA.5-desaturation of 18:2(n-6) and 18:3(n-3). The activities of .DELTA.6- and .DELTA.5-**desaturase** in HL-60 and U937 cells increased when differentiation also stimulated the synthesis of eicosanoids and extracellular release of PUFA.

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ACCESSION NUMBER: 95083286 EMBASE  
DOCUMENT NUMBER: 1995083286  
TITLE: Separation and quantification of the triacylglycerols in evening primrose and borage oils by reversed-phase high-performance liquid chromatography.  
AUTHOR: Redden P.R.; Huang Y.-S.; Lin X.; Horrobin D.F.  
CORPORATE SOURCE: Efamol Research Institute, Kentville, NS B4N 4H8, Canada  
SOURCE: Journal of Chromatography A, (1995) 694/2 (381-389).  
ISSN: 0021-9673 CODEN: JCRAEY  
COUNTRY: Netherlands  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 029 Clinical Biochemistry  
037 Drug Literature Index  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB Evening primrose and borage oil are used frequently in nutritional and clinical studies where an impaired .DELTA.6-**desaturase** enzyme activity may be bypassed by supplementation with .gamma.-linolenic acid (GLA, 18:3n - 6). The separation and quantification of the triglycerides of borage oil and evening primrose oil has been carried out using reversed-phase HPLC with UV detection. Borage oil was found to have 34 UV-detectable fractions and evening primrose 22. The TG fractions were collected manually, their fatty acid composition determined and quantified with an internal standard. The probable identity of the individual TG fractions was deduced using the fatty acid composition of the TG fractions, calculated theoretical carbon numbers (TCN) for the various TG species and the predicted probability of occurrence. Correction factors, U(i), for GLA (18:3n - 6), gadoleic acid (20: 1n - 9), erucic acid (22:1n - 9) and nervonic acid (24:1n - 9) were estimated to be 0.3-0.4, 0.6, 0.4 and 0.3, respectively, and are used along with other known U(i) correction factors for unsaturated fatty acids to calculate TCN values for all the TG species. These U(i) values represent the loss in affinity of the **unsaturated fatty acid** for the reversed-phase C-18 stationary phase. The reversed-phase HPLC trace of borage oil is much more complex compared to evening primrose oil. Apart from differences in the total fatty acid composition there are substantial differences in the quantity of individual TG species present in the two oils. The clinically important fatty acid, .gamma.-linolenic acid, is distributed much more widely throughout the TG species of borage oil compared to evening primrose oil. Over 90% of the GLA present in evening primrose occurs in

the first 9 eluting TG species whereas only about 65% is found in these TC species of borage oil.

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ACCESSION NUMBER: 93028448 EMBASE  
DOCUMENT NUMBER: 1993028448  
TITLE: Effects of weight loss on the fatty acid composition of serum lipids in obese women.  
AUTHOR: Christophe A.; Vermeulen A.  
CORPORATE SOURCE: Laboratory for Dietetics, University Hospital, Clinic Building 12, De Pintelaan 185,B-9000 Gent, Belgium  
SOURCE: Annals of Nutrition and Metabolism, (1992) 36/5-6 (336-342).  
ISSN: 0250-6807 CODEN: ANUMDS  
COUNTRY: Switzerland  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 018 Cardiovascular Diseases and Cardiovascular Surgery  
029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB The effect of a weight reduction regimen, consisting of a protein-sparing modified fast and an exercise program, on the fatty acid composition of serum phospholipids and cholesterol esters of obese women, is described. In phospholipids, this treatment did not induce any significant change of the different fatty acid families (total saturated, monounsaturated, .omega.9, .omega.7, .omega.6 and trans-fatty acids), except for total .omega.3 fatty acids which increased. Within families, individual fatty acids change however. The changes are compatible with increased .DELTA.5 and .DELTA.6 **desaturase** activity. In cholesteryl esters, significant changes occurred which are suggestive of an increase in serum of the fraction of cholesteryl esters of intracellular origin. The changes in fatty acid compositions may not be beneficial with respect to atherosclerosis.

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ACCESSION NUMBER: 92124599 EMBASE  
DOCUMENT NUMBER: 1992124599  
TITLE: Effects of n-3 and n-6 fatty acids on tumor necrosis factor cytotoxicity in WEHI fibrosarcoma cells.  
AUTHOR: Brekke O.-L.; Espevik T.; Bardal T.; Bjerve K.S.  
CORPORATE SOURCE: Clinical Chemistry Department, University Hospital, University of Trondheim,N-7006 Trondheim, Norway  
SOURCE: Lipids, (1992) 27/3 (161-168).  
ISSN: 0024-4201 CODEN: LPDSAP  
COUNTRY: United States  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 016 Cancer  
029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB Modulation by fatty acids of the cytotoxic effect of recombinant tumor necrosis factor alpha (TNF) toward WEHI 164 mouse fibrosarcoma cells has been examined. Preincubating the highly TNF-sensitive WEHI clone 13 cells for 44 hr with 50 .mu.mol/L of 20:5n-3, 22:6n-3, 18:3n-6, 20:3n-6 or 20:4n-6 reduced cell survival 22 hr after challenge with TNF (40 ng/L) by 65%, 72%, 60%, 98% and 85%, respectively. In comparison, 18:3n-3, 18:2n-6 and 18:1n-9 had only negligible effects on TNF-induced toxicity. Different extent of fatty acid incorporation into cell total phospholipids or triglycerides could not explain the observed effects on TNF cytotoxicity, and the enhanced cytotoxicity could therefore not be explained merely by an increased unsaturation of the cell membranes. In addition to the fatty

acid supplied, preincubation with 18:2n-6, 18:3n-6 or 18:3n-3 also enriched the cells with 20:2n-6, 20:3n-6 and 20:3n-3, respectively, most likely due to chain elongation. The results suggest that the WEHI cells have a low **.DELTA.6 desaturase** activity, and that n-6 and n-3 acids must have at least 3 or 4 double bonds, respectively, to enhance TNF cytotoxicity in WEHI cells. Dexamethasone partly inhibited TNF-induced cytotoxicity, while cyclooxygenase, thromboxane synthetase or lipoxygenase inhibitors had no or negligible effects. The antioxidant butylated hydroxyanisole (BHA) completely inhibited TNF-induced cytotoxicity, while the structurally and functionally similar antioxidant butylated hydroxytoluene had no such effect, indicating that BHA does not block TNF cytotoxicity through its antioxidant effect. The results suggest that TNF cytotoxicity involves, directly or indirectly, metabolism of long-chain polyunsaturated fatty acids, and we speculate that fatty acid metabolites are involved.

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ACCESSION NUMBER: 89101091 EMBASE  
DOCUMENT NUMBER: 1989101091  
TITLE: Effect of dietary fats on linoleic acid metabolism. A radiolabel study in rats.  
AUTHOR: Zevenbergen J.L.; Houtsmuller U.M.T.  
CORPORATE SOURCE: Unilever Research Laboratorium Vlaardingen, 3130 AC Vlaardingen, Netherlands  
SOURCE: Biochimica et Biophysica Acta - Lipids and Lipid Metabolism, (1989) 1002/3 (312-323).  
ISSN: 0005-2760 CODEN: BBLA6  
COUNTRY: Netherlands  
DOCUMENT TYPE: Journal  
FILE SEGMENT: 029 Clinical Biochemistry  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB Effects on the linoleic acid metabolism in vivo of three dietary fats, rich in either oleic acid, trans fatty acids or .alpha.-linolenic acid, and all with the same linoleic acid content, were investigated in male Wistar rats. After 6 weeks of feeding, the rats were intubated with [1-14C]linoleic acid and [3H]oleic acid. The incorporation of these radiolabels into liver, heart and serum was investigated 2, 4, 8, 24 and 48 h after intubation. The amount of 14C-labelled arachidonic acid incorporated into the liver phospholipid of the group fed the oleic acid-rich diet was significantly higher than that of the other groups. However, compared to the trans fatty acids-containing diet, the oleic acid-rich diet induced only a slightly higher arachidonic acid level in the phospholipid fraction of the tissues as determined by GLC. Dietary .alpha.-linolenic acid more than halved the arachidonic acid levels. Our results do not support the hypothesis that the **.DELTA.6-desaturase** system actually determines the polyunsaturated fatty acid levels in tissue lipids by regulating the amount of polyunsaturated fatty acids (e.g., arachidonic acid) synthesized. The biosynthesis of polyunsaturated fatty acids only is not sufficient to explain the complicated changes in fatty acid compositions as observed after feeding different dietary fats.

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ACCESSION NUMBER: 88095152 EMBASE  
DOCUMENT NUMBER: 1988095152  
TITLE: [Clinical and immunological effects of unsaturated fatty acids in patients with atopic eczema].  
KLINISCHE UND IMMUNMODULATORISCHE EFFEKTE EINER BEHANDLUNG MIT UNGESATTIGTEN FETTSÄUREN BEI ATOPISCHER DERMATITIS.  
AUTHOR: Wehrmann W.; Niedecken H.; Bauer R.

CORPORATE SOURCE: Universitäts-Hautklinik Bonn, D-5300 Bonn 1, Germany  
SOURCE: H+G Zeitschrift für Hautkrankheiten, (1987) 62/SUPPL.  
(111-115).  
ISSN: 0301-0481 CODEN: ZHKRAJ

COUNTRY: Germany  
DOCUMENT TYPE: Journal

FILE SEGMENT: 013 Dermatology and Venereology  
007 Pediatrics and Pediatric Surgery

LANGUAGE: English

SUMMARY LANGUAGE: German; English

AB The metabolism of essential unsaturated fatty acids seems to show changes in patients with atopic dermatitis (AD). A defect or a deficiency of a **Delta-6-Desaturase**, which transforms cis-linoleic acid into gamma-linoleic-acid will be discussed. We examined the influence of a treatment with unsaturated fatty acids on clinical phenotype and the surface antigens of lymphocytes in peripheral blood. Prolonged recurrence free intervals as well as a faster ability to control relapse were established. Dysbalance in the lymphocytic system was able to be positively influenced. We found an increase of Leu 2 a-antigen carrying T-suppressor-lymphocytes and of the Leu 3+8+-antigen carrying subpopulation of T-helper-lymphocytes, which are responsible for activation of precursor T-suppressor cells into.

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ACCESSION NUMBER: 75097121 EMBASE

DOCUMENT NUMBER: 1975097121

TITLE: [Regulation of the biosynthesis of fatty acids of the oleic series by competitive reactions with unsaturated fatty acids at the step of the microsomal 5 **desaturase**].

REGULACION DE LA BIOSINTESIS DE ACIDOS GRASOS DE LA SERIE OLEICA POR REACCIONES DE COMPETENCIA CON ACIDOS GRASOS NO SATURADOS A NIVEL DE LA 5 DESATURASA MICROSMAL.

AUTHOR: Castuma J.C.; Catala A.; Brenner R.R.; Christie W.W.

CORPORATE SOURCE: Cat. Bioquim., Inst. Fisiol., Fac. Ci. Med., Univ. Nac., La Plata, Argentina

SOURCE: Acta Physiologica Latino-Americana, (1974) 24/1 (31-39).  
CODEN: APLTAF

DOCUMENT TYPE: Journal

FILE SEGMENT: 029 Clinical Biochemistry

LANGUAGE: Spanish

AB The competitive action of fatty acids of the oleic, linoleic and .alpha. linolenic series with different chain length and number of double bonds, on oxidative desaturation of eicosa 8, 11 dienoic 1 14C acid to eicosa 5,8,11 trienoic acid was investigated. A complete series of octadecadienoic acids with divinyl structure (from 2,5 to 14,17) was also investigated. It was found that the microsomal 5 **desaturase** of rat liver that desaturated eicosa 8,11 dienoic acid was inhibited competitively by the fatty acids and that competition was proportional to the amount of fatty acid added. In general, increase of the number of double bonds for a particular chain length increased the inhibition, but the position of the double bonds in the fatty acid molecule was also important for the degree of inhibition. The highest inhibition was produced by the eicosapentaenoic acid of the .alpha. linolenic series. It is concluded that the 5 **desaturase** is an additional and secondary point of control, besides the 6 **desaturase** which is the most important one in the biosynthesis of polyenoic acids.